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EFFECTS OF CHRONIC OMEGA 3 POLYUNSATURATED FATTY ACID SUPPLEMENTATION ON HUMAN ATRIAL ELECTROPHYSIOLOGY AND INDUCIBILITY OF ATRIAL FIBRILLATION IN THE ABSENCE OF ATRIAL SUBSTRATE

ACC Poster Contributions
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Session Title: Clinical Electrophysiology -- AF Mechanisms
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Background: Animal studies have shown that the omega 3 polyunsaturated fatty acids in fish oils have anti-fibrillatory effects. In humans, their mechanism of action remains poorly understood. We investigated the effects of chronic omega 3 supplementation on human atrial electrophysiology in the absence of atrial substrate for atrial fibrillation (AF).

Methods: Patients without structural heart disease or clinical AF undergoing ablation for supraventricular tachycardia were prospectively recruited into: a control group with fish intake ≤1/week and an omega 3 group prescribed 2 g/day fish oil for a ≥1 month prior to their electrophysiology (EP) study. The following were compared at EP: serum eicosopentanoic acid (EPA) and docosahexaenoic acid (DHA) levels, effective refractory periods (ERPs) at the right atrial appendage, proximal and distal coronary sinus (CS); interatrial, intra-atrial, left atrial and CS conduction at baseline and with shortest propagated extra-stimulus; sinus node function, P wave duration and AF inducibility (10 inductions/patient)

Results: Patients were well matched for age (44± 13 yrs), gender (67% females), findings at EP study, left atrial dimensions and left ventricular function. After a mean duration of fish oil ingestion of 60±44 days, the following significant differences were noted favoring the omega 3 over the control group at time of EP (i) 2.7 fold higher EPA and 2 fold higher DHA level (ii) 8-14% longer atrial ERP at all sites (iii) less inter-atrial, intra-atrial, left atrial and coronary sinus maximal conduction delay with no difference in baseline conduction (iv) no effect on sinus node function or P wave duration (v) lower incidence of inducible AF (AF ≥30 s: 24.2% vs. 7.9%, P<.001, (v) shorter mean duration of induced AF (vi) prolongation of induced AF cycle length. Serum DHA was protective against inducible AF, but EPA was not.

Conclusions: In the absence of atrial substrate for AF, chronic omega 3 supplementation in humans prolongs atrial and CS refractoriness; reduces conduction anisotropy and reduces propensity for inducible AF. These electrophysiological changes may be responsible for the protective effect of fish oils against AF in a subset of patients.